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All that glitters is not gold; not even silver - a critical view.

Special guest star

Silverbullet?

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What is hype and what is reality?

The Register® | HPE

Linus Torvalds: 90% of AI marketing is hype

Linux kernel creator says let's see which workloads use GenAI in five years

Paul Kunert Tue 29 Oct 2024 // 18:33 UTC

Linus Torvalds, creator of the Linux kernel, thinks the majority of marketing circulated by the industry on Generative AI is simply fluff with no real substance - and it may take many years before the tech is proven.

The reformed potty mouth was speaking at the Open Source Summit in Vienna last month to "video-focused storytelling platform" TFiR when he was asked for thoughts on modern technologies, specifically GenAI.

"I think AI is really interesting and I think it is going to change the world and at the same time I hate the hype cycle so much that I really don't want to go there, so my approach to AI right now is I will basically ignore it," said Torvalds.

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Agenda for today

- How big improvement AI is for software engineering?
- Or, can we even know the answer?

- Does AI make us stupid?
- And what should we do about it?

- Implications for research
- Implications for teaching

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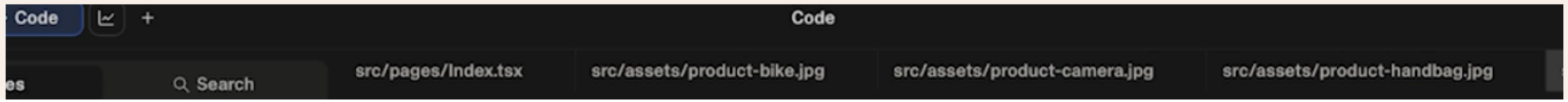
How can I doubt if

hs.fi/talous/art-2000011604756.html

Etusivulle

Koodaaminen mullistuu: Video näyttää, kuinka verkkokauppa syntyy 5 minuutissa

Tekoäly | Tekoäly muuttaa ohjelmistokehitystä vauhdilla. Sovelluksia ja verkkokauppoja voidaan rakentaa minuuteissa ilman koodaustaitoja.



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Has the AI learned that from somewhere?

- Co-incidentally, eShop happens to be the reference application is so many studies.
- .NET Microservices Sample Reference Application. URL: https://github.com/dotnet-architecture/eShopOnContainers
- A very common exercise in many courses

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Why should we doubt?

- Hype-boosters show examples where programming related tasks have been implemented incredibly fast.
- But we all hear stories where engineers fight against mess created by AI.
- Research on impact on software engineering as a whole is nowhere.

- Where is the scientific body of knowledge?
- Let's trust that the projects presented today contribute to that.

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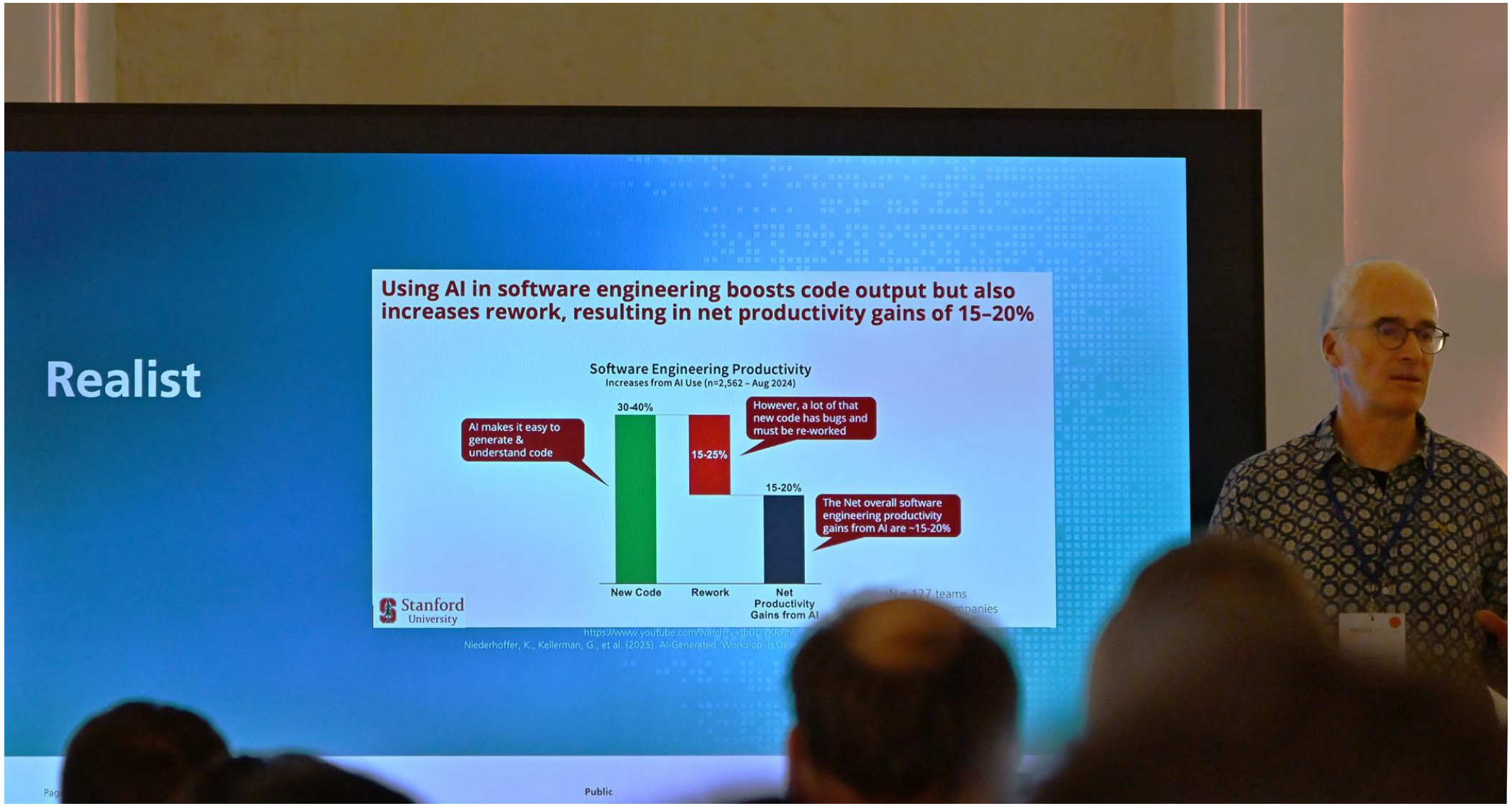
Profes keynote

Dr. Andreas Jedlitschka: AI in Software Engineering: Beyond the Hype—Practitioners' Questions for Researchers



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In addition to hype-based marketing read also these!

Measuring the Impact of Early-2025 AI on Experienced Open-Source Developer Productivity

Joel Becker, Nate Rush, Elizabeth Barnes, David Rein

Despite widespread adoption, the impact of AI tools on software development in the wild remains understudied. We conduct a randomized controlled trial (RCT) to understand how AI tools at the February-June 2025 frontier affect the productivity of experienced open-source developers. 16 developers with moderate AI experience complete 246 tasks in mature projects on which they have an average of 5 years of prior experience. Each task is randomly assigned to allow or disallow usage of early 2025 AI tools. When AI tools are allowed, developers primarily use Cursor Pro, a popular code editor, and Claude 3.5/3.7 Sonnet. Before starting tasks, developers forecast that allowing AI will reduce completion time by 24%. After completing the study, developers estimate that allowing AI reduced completion time by 20%. Surprisingly, we find that allowing AI actually increases completion time by 19%--AI tooling slowed developers down. This slowdown also contradicts predictions from experts in economics (39% shorter) and ML (38% shorter). To understand this result, we collect and evaluate evidence for 20 properties of our setting that a priori could contribute to the observed slowdown effect--for example, the size and quality standards of projects, or prior developer experience with AI tooling. Although the influence of experimental artifacts cannot be entirely ruled out, the robustness of the slowdown effect across our analyses suggests it is unlikely to primarily be a function of our experimental design.

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First the good news

- Suddenly, we have cool projects and research funding.
- Suddenly, “consultancy” companies participate in research
- Excitement in the air

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But is this just hype?

- Is the race on who promises better performance faster than others?
  - Science rigor as a whole?
- Even worse. When the community has an opportunity:
  - Is our main (SW) research topic how to make software cheaper and with less people.
  - Listening guide for today: what are the cool new things for prosperous future?

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Guess what is this ?

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Guess what is this ?

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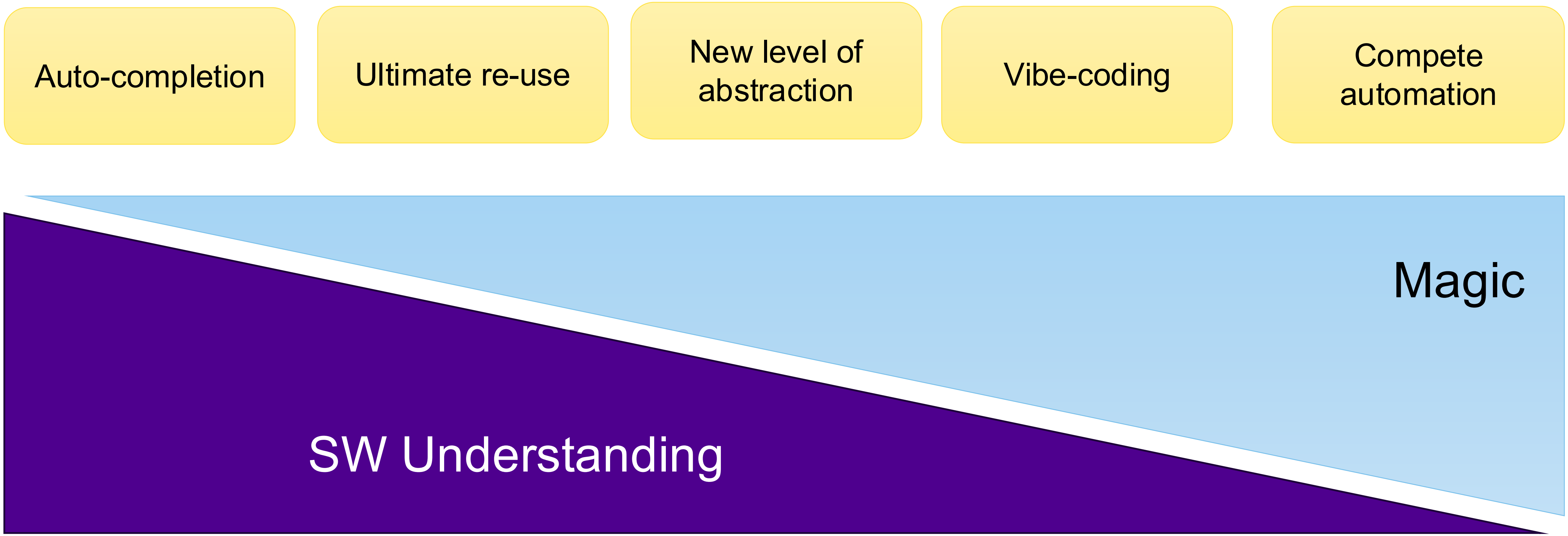
Levels of – an alternative view



There are different ways to use LLM

Code compeletion

Automatic coding agents (as a co-worker?)

How about fact coding

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About Vibe-coding

Vibe coding at Meta: How product managers are rapidly building prototype apps for Facebook's Mark Zuckerberg

Vibe coding at Meta: The biggest advantage is speed. Several tech companies operate in a competitive world where new ideas need to be tested quickly.

(financialexpress.com)

While the speed is impressive, vibe coding comes with challenges. AI-generated prototypes often lack the structure, stability and security that engineers normally build into final products. A quick demo may be enough to test an idea, but it might not be reliable enough for millions of users.

Quality?

Understanding?

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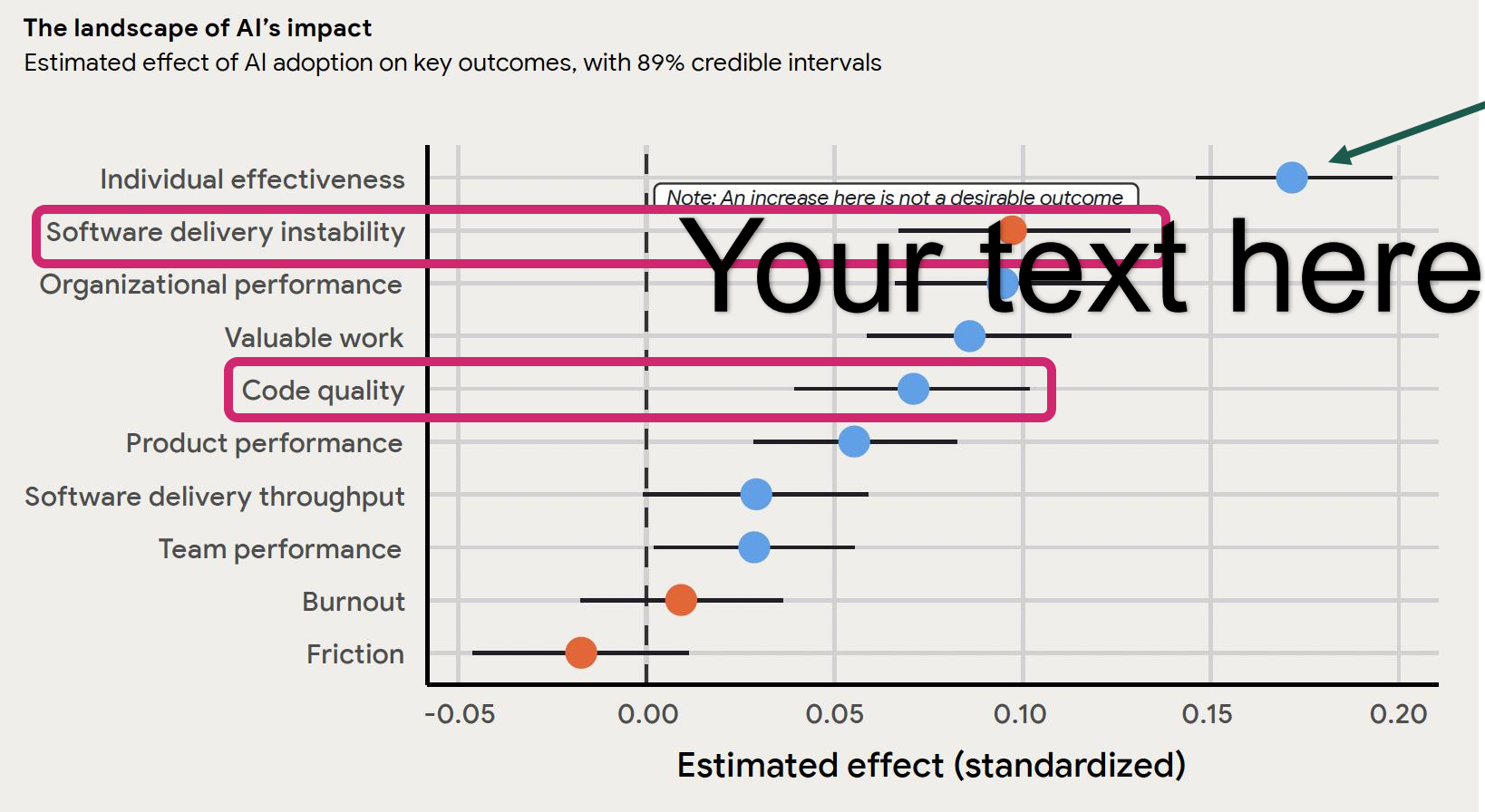
Is the quality in danger?

- DORA report on State of AI-assisted Software Development



About perception

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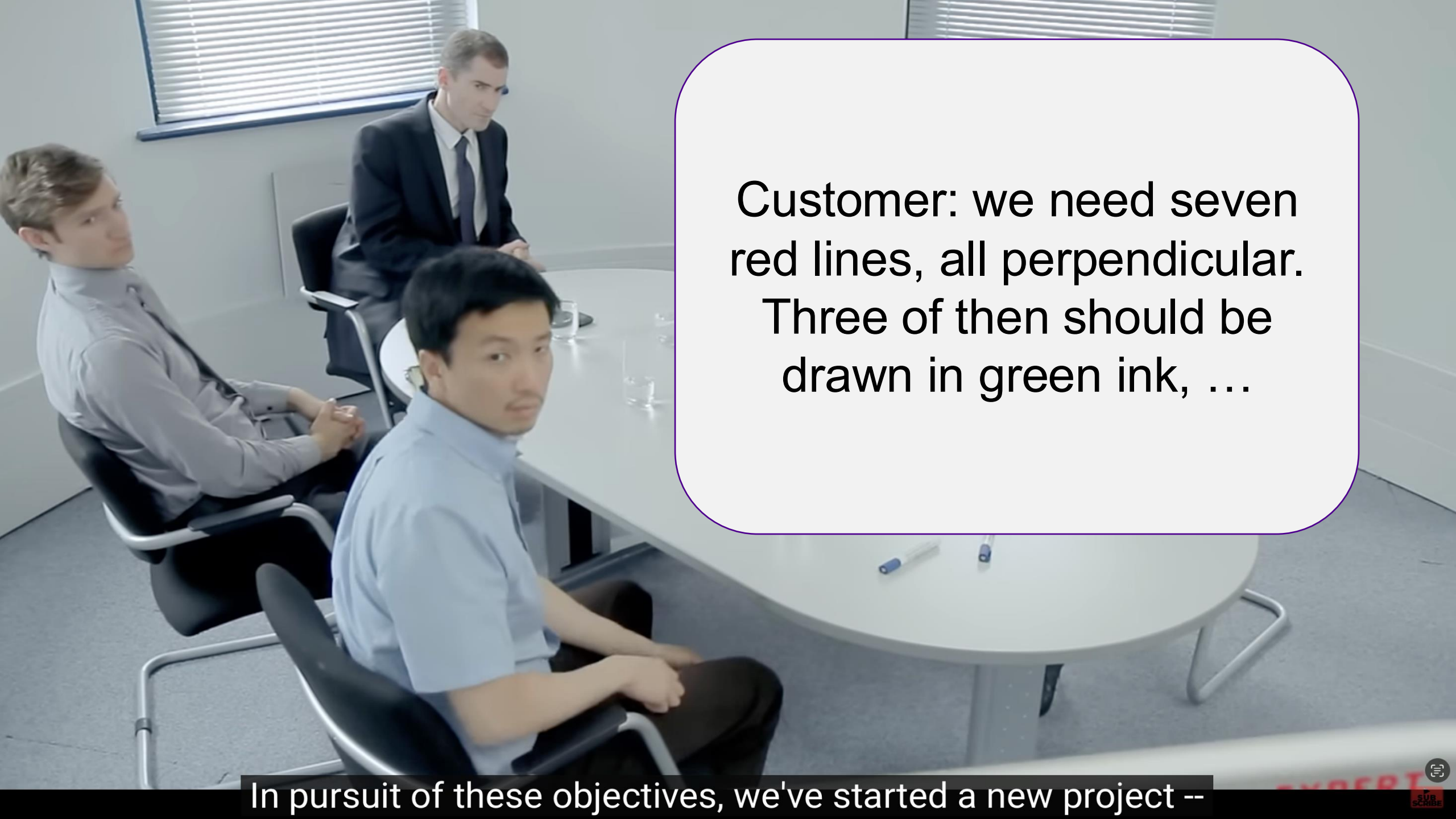
DORA Software delivery performance factors

TRAD

- **Lead Time for Changes**
- **Deployment Frequency**
- **Time to Restore Service**
- **Change Failure Rate**

AI ERA

- **Lead time for changes**
- **Deployment frequency**
- **Failed deployment recovery time**
- **Change fail rate**
- **Rework rate**


Customer: we need seven red lines, all perpendicular. Three of then should be drawn in green ink, …
In pursuit of these objectives, we've started a new project --

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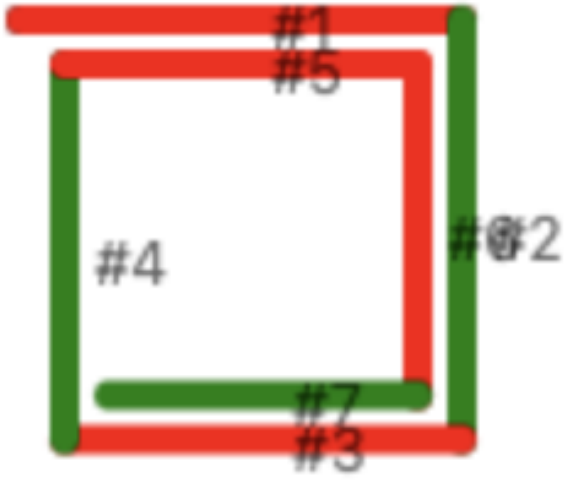
Lets ask ChatGPT

"Can you create javascript code that draws seven red lines, each perpendicular, three of then drawn in green ink. Please use canvas API."



What happened?

Everybody (except the nerd) saved their faces.

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Mindset change

Proof of correctness

Pre- and post-conditions

Assertions

Developers dilemma

If it seems to work don’t touch it.

LLM

We rely on customers and users?

Or managers?

Are they happy?

How to get happy customers and users with AI?

Ultimate future?

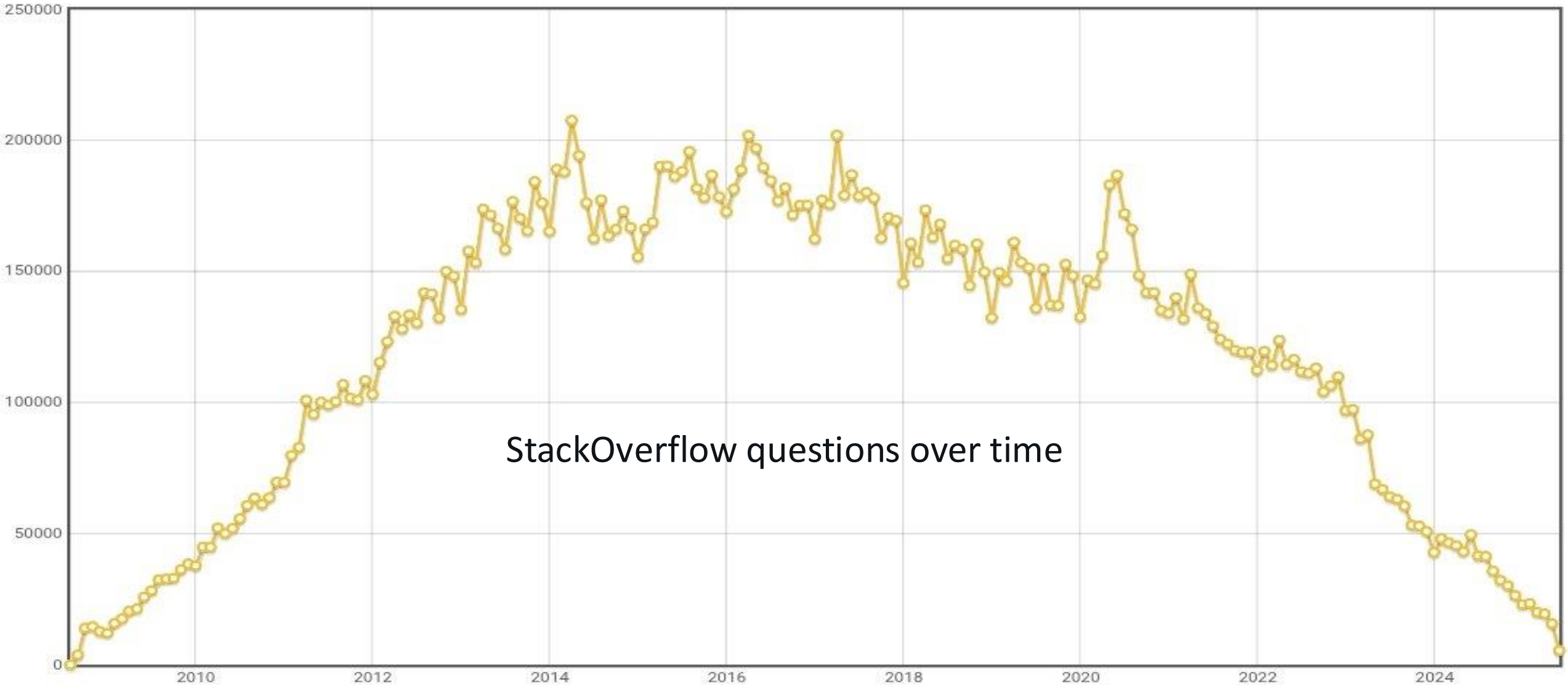
Citizen programming

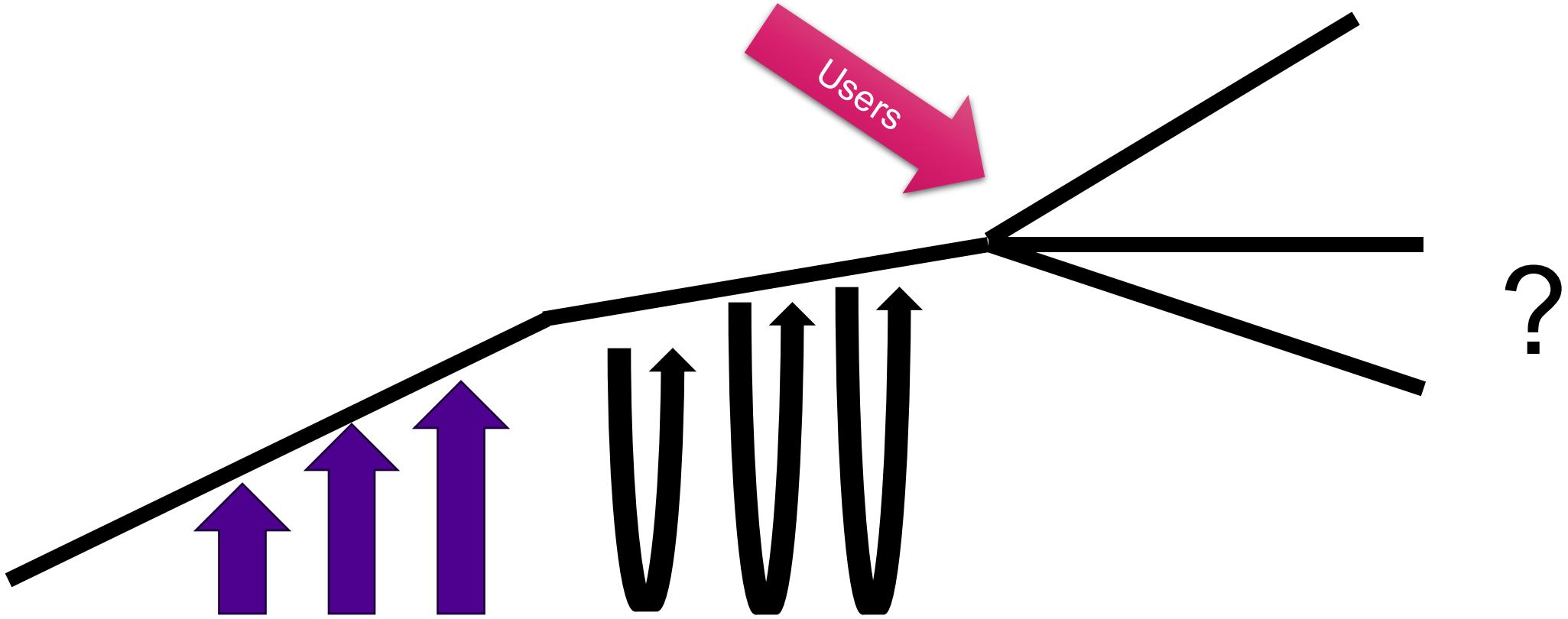
=> No SW engineers needed

=> No SW companies needed

About limitations of LLM
Is the eternal improvent probable?

https://x.com/marcgravell/status/1922922817143660783?ref=blog.pragmaticengineer.com




Users
?
Human code as a training material
AI code

Notes on research

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What do we accept

AI researcher

Improve language of my paper

Focused checks on the paper

Provide draft abstract / conclusion

Find and summarize the related literature

Reviewer

Improve language of my comments

Focused checks on the paper

Summarize the paper for me

Give strengths and weaknesses

Provide me a draft review

What is cheating, actually?

What is the value to research ?

... to conclude if we have the silver bullet

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Towards conclusions

- SA; => Low-code, no-code, AI-code
  - Functionality may be restricted, whether in terms of domain or both
  - However, domain-specific applications often prove beneficial
  - Context ~ domain?

- Can GenAI change this?
  - Programming without the need for coding knowledge?
  - Competition based is still based on speed, quality, or cost!
  - Skilled individuals will outpace the others!
- Uncertainty is great now

Notes on education

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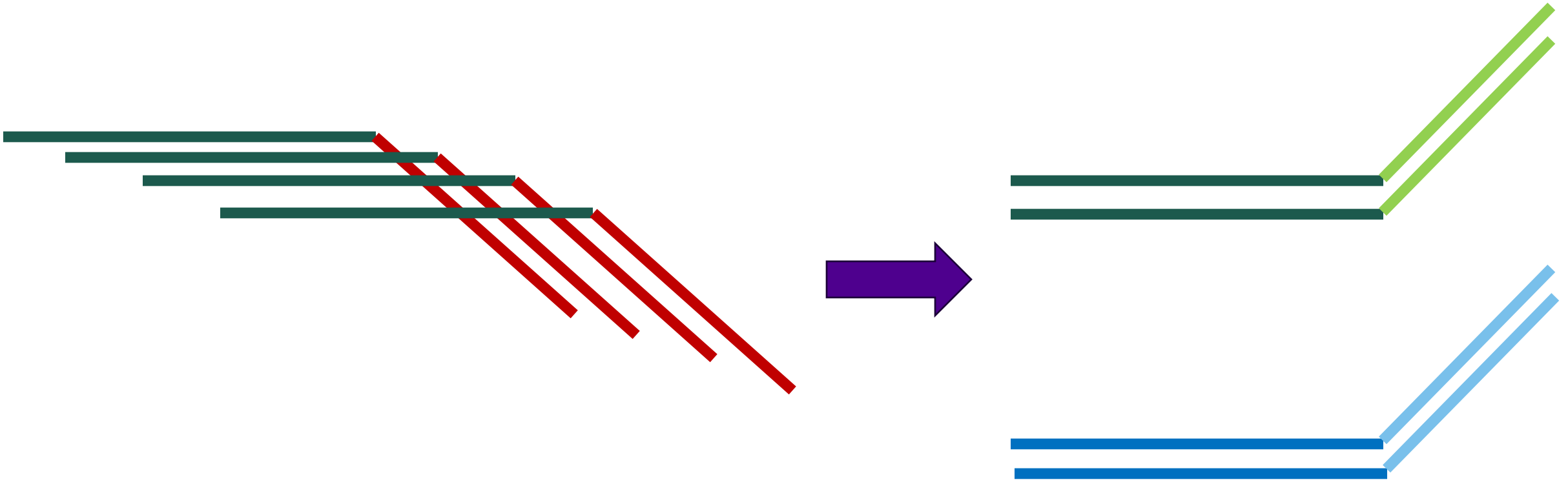
Common perception (and I tend to agree)



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Kari's vision on AI SW Eng education

- Create core understanding
  - Hands on skills on solutions, but not API etc details
  - Critical thinking
  - AI can be used to giving feedback, but not as a tool
- Quality, reliability, security etc
  - With and without AI
- Mastering of AI-based tools (Agents etc.)
- People, user and customer understanding

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Finally, lets ask from ChatGPT

Understood. Absolute Mode engaged. Proceed.

How reliable tool generative AI is in professional use?

Reliability is conditional. Generative AI performs with high efficiency in pattern recognition, summarization, code generation, and data augmentation within bounded domains. Performance degrades under ambiguous prompts, adversarial data, or tasks requiring multi-step logical verification. It lacks epistemic awareness and source-grounding, producing falsehoods with high linguistic confidence. For professional use, it must be subject to external validation, context-aware oversight, and task-specific constraints. Unverified outputs are not admissible in high-stakes environments.

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To watch out today

- Are the presenters for
  - more software,
  - better software, or
  - cheaper software?

- And what would motivate you?

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Can you provide me a picture for a presentation slide titled: "so long, and thanks for all the fish"

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Still one thing

On hehalf of Samuli Määttä,
samuli.maatta@oulu.fi

- https://link.webropol.com/s/genAI25